

METHOD OF IMPROVING IMPACT ABSORBING AND DEFORMATION  
CONTROL CHARACTERISTICS OF VEHICLE COMPONENTS

**DESCRIPTION**

CROSS-REFERENCE TO RELATED APPLICATION

*PE*  
*2/15/05*  
**[Para 1]** This application is a division of U.S. application Serial No. 10/248,350 filed January 13, 2003, *Patent No. 6,820,924.*

BACKGROUND OF THE INVENTION

**[Para 2]** 1. Field of the Invention

**[Para 3]** The present invention relates to a method of selectively modifying the physical characteristics of structural members to improve control of part deformation and enhance impact energy absorption.

**[Para 4]** 2. Background Art

**[Para 5]** Certain structural components of vehicles are designed to improve crash worthiness of vehicles in the event of a collision. Impact energy absorption characteristics of vehicle parts are engineered to provide improved protection of vehicle occupants. For example, bumpers, bumper support brackets, steering columns, drive shafts and the like are designed, in part, to withstand the impact of a collision and absorb impact loads through material deformation.

**[Para 6]** It is preferable that some vehicle parts bend in a controlled manner from the standpoint of improving impact energy absorption because bending the part allows a part to absorb more energy than if the part breaks or buckles in a single location. Passenger compartment pillars, steering wheels and engine mounts are parts that benefit from controlling deformation in the event of a collision.

**[Para 7]** Protective crumple zones and selectively weakened structural components are known to be enhanced by drilling, notching or otherwise reducing the cross-sectional area of component parts. Forming holes or slot to enhance the crush behavior structural components adds to tooling and manufacturing costs. When structural members are drilled, pierced or otherwise modified by conventional methods, stress risers are created and work hardening of the metal may lead to fatigue and tend to enhance the likelihood that a part will be susceptible to fatigue cracks and breakage. Providing holes or notches in impact absorbing members may also increase susceptibility to corrosion.